State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

Pesticide Control Program – MC 401-04A
PO Box 420
Trenton, NJ 08625-0420
Phone: (609)530-4070 Fax: (609)984-6555
Website: www.pcpnj.org

BOB MARTIN
Commissioner

June 27, 2012

Attention: Team Lead – Conrath.andrea@epa.gov

email only

Risk Integration, Minor Use and Emergency Response Branch
U.S. EPA, Office of Pesticide Programs (7505P)
Room S4900, One Potomac Yard
2777 Crystal Dr.
Arlington, Virginia 22202

Re: Emergency Exemption Petition Section 18
New Jersey
Brown Marmorated Stink Bugs

Dear Ms. Conrath;

The New Jersey Department of Environmental Protection, Pesticide Control Program, Bureau of Licensing Programs requests an expedited specific exemption for the use of bifenthrin to control Brown Marmorated Stink bugs in Stone and Pome fruit. New Jersey is one of the seven Mid-Atlantic States asking for this exemption. Please refer to the enclosed data to support this request.

If you have any questions pertaining to this matter, please contact me at (609) 984-6868 or by letter at the above address.

Sincerely,

Charles L. Maack

Charles L. Maack, Chief
Bureau of Licensing Programs
Compliance and Enforcement

c: Carl Schulze, Jr., NJ Department of Agriculture, email only
Dean Polk, Rutgers Department of Entomology, email only
Patricia Hastings, Rutgers, email only
Thomas H. Zachos, USEPA, email only

Application for Section 18 Emergency Exemption

The following information is required for an emergency exemption request based on the revised United States Environmental Protection Agency (USEPA) Code of Federal Regulations, Title 40, Part 166 concerning Section 18 requests. Requests which are incomplete will be denied by the USEPA without review. In order to comply with these requirements, the information listed below must be provided. Use additional pages if necessary. Please note that the more complete the questionnaire, the better your chances are of obtaining the exemption.

Type of Exemption Being Requested
(Check One)

X **SPECIFIC**
□ **QUARANTINE**
□ **PUBLIC HEALTH**

Contact Person(s) and/or Qualified Expert(s)

CONTACT PERSON:
Name: Charles L. Maack
Title: Chief, Pesticides Operations
Organization: New Jersey Department of Environmental Protection
Address:
Mail Code 404-04A
PO Box 420
Trenton, NJ 08625-0420

Phone: 609-984-6868
FAX: 609-984-6555
Email: Charles.maack@dep.state.nj.us

QUALIFIED EXPERT:
Name: Dean Polk
Title: IPM Specialist for Fruit
Organization: Rutgers University, Department of Entomology
Address: Rutgers Fruit Research & Extension Center, 283 Route 539 Center
Cream Ridge, NJ 08514

Phone: 609-758-7311
FAX: 609-758-7085
Email: polk@aesop.rutgers.edu

Description of Pesticide Requested

Common Chemical Name **(Active Ingredient):** bifenthrin (IRAC Group 3 Pyrethroids)

Brand/Trade Name(s): Brigade, Bifenture	**EPA Reg. Nos.:** 279-3313 and 70506-227
Formulation: 2EC and 10DF, respectively	**% Active Ingredient:** 25.1% and 10%, respectively

Manufacturer(s): FMC Corporation Agricultural Products Group, United Phosphorus Inc.
Address:
1735 Market Street Philadelphia, Pa. 19103 USA,
630 Freedom Business Center, Suite 402 King of Prussia, Pa. 19406 USA

If the product is **currently** federally registered include: (A) A copy of the federal label of the specified product; or the formulation(s) requested if a specific product is not request; and (B) A copy of any proposed additional Section 18 labeling. For **any other products** submit a copy of the confidential statement of formula or reference to one already submitted to USEPA and a complete copy of the proposed Section 18 labeling.

Notification of Registrant

Date Sent: February, 2011	**Response Received:** FMC 3/18/12, UPI 3/13/12 **Representative**: FMC (Brigade) Contact: Adam Prestegord: Phone – (215) 299-6250. UPI (Bifenture) Contact: Dave Olson: Phone – (610) 491-2814.

Include Letter from Registrant as Separate Attachment.

Name of Pest

Scientific Name: *Halyomorpha halys* (Stål) (Hemiptera: Pentatomidae)
Common Name: brown marmorated stink bug (BMSB)
Overview of BMSB phenology in the Mid-Atlantic region. BMSB is a new invasive pest that has proven to be significantly more difficult to contol than native stink bugs. BMSB overwinters as an adult (Watanabe et al. 1994) in a state of facultative diapause. The influence of potential mortality factors on the survivorship of this generation of BMSB in the eastern US has not been investigated. Adults emerge from overwintering sites in April and May and begin mating approximately two weeks later (Hoebeke and Carter 2003). Although females commonly mate several times, a single mating can result in egg production over half of their lives (Kawada and Kitamura 1983). Females typically deposit eggs in clusters on the undersides of leaves (Takahashi 1930). Each egg mass contains ~28 eggs (Kawada and Kitamura 1983, Nielsen et al. 2008a) and the reports of the average total number of eggs deposited per female range from about 212 (Nielsen et al. 2008a) to about 486 (Kawada and Kitamura 1983). Unlike the native species of stink bugs, whose nymphs feed on broadleaf weeds and other hosts outside the orchard, BMSB females also deposit eggs on orchard trees and nymphs and feed and complete their development on pome and stone fruit. Nielsen et al. (2008a) determined that development from egg to adult, including five nymphal instars, required approximately 50 d.

Nielsen et al. (2008a) also reported that BMSB populations in central NJ and PA showed one generation per year, while Leskey et al. (unpubl. data) documented two generations in Kearneysville, WV. Overlapping nymphal and adult populations from these two generations in parts of the Mid-Atlantic region create a scenario in which tree fruit crops may be at continuous risk of attack. Since Hoffmann (1931) reported up to six generations annually in the southern parts of its range in China, BMSB is expected to show multiple generations in southern regions of the USA.

BMSB has pronounced dispersal behaviors and movement patterns. In spring, populations move from overwintering sites in woodlots, rock outcrops, and buildings in search of host plants, including tree fruit crops. During the growing season, BMSB is thought to move back and forth between native hosts and crops and between different crops. Although the timing of this movement in relation to its phenology or that of its different hosts is poorly understood, the potential for ongoing immigration of BMSB into tree fruit orchards during the growing season is a major concern. In late September and October, the second generation of BMSB adults returns to overwintering sites, often as massive aggregations consisting of thousands or tens of thousands of individuals. Its invasion of buildings during that period has potentially serious economic consequences for commercial enterprises (e.g. the hospitality industry) and also represents a very significant nuisance issue for homeowners.

Description of Proposed Use

Sites to be treated (i.e. crops, structures, etc): apple, peach, and nectarine orchards in New Jersey, Pennsylvania, Maryland, Delaware, West Virginia, Virginia and North Carolina

Statewide or County specific (list counties):
New Jersey: Hunterdon, Warren, Morris, Sussex, Burlington, Middlesex, Mercer, Monmouth, Atlantic, Camden, Cumberland, Gloucester, Salem, Bergen, Somerset and Ocean counties
Pennsylvania: Statewide
Delaware: Statewide
Maryland: Statewide
West Virginia: Berkeley, Hampshire, Jefferson, Morgan and Monroe counties.
Virginia: Statewide
North Carolina: Henderson, Polk, Cleveland, Lincoln, Wilkes, Alexander, Moore, Montgomery and Anson counties.
Rational for a Section 18 for two Manufacturers': The registrants were selected based on product availability in the region and the grower's familiarity with these products. The request is intended to meet the grower's needs. There was a concern from State Extension Specialist's regarding the amount of product available in the channel of trade and product distribution limitations in the region thus the need for multiple registrant participation for the 18 request. For example there are 4 major retailers and distributors of agrichemicals in NJ. Brigade (FMC) and Bifenture (UPI) were the most commonly available formulations in 2011, likely due to their use patterns in sweet corn, tomatoes, and wine grapes.

Method of application: Foliar application by ground airblast equipment

Rate of application in terms of active ingredient (a.i.): For Brigade and Bifenture, a total seasonal maximum of 0.45 lb bifenthrin a.i. per acre, post bloom

Frequency/Timing of Application: Not less than thirty (30) day intervals

Maximum number of applications: Up to five (5) applications per season. (the rate per application would vary, but total applications must not exceed seasonal maximum of 0.45 lbs a.i. per acre)

Total acreage (or other units) to be treated: USDA NASS data for 2010 indicate 63,550 acres of bearing tree fruit orchards among six of the seven participating states (DE statistics not provided). These data reflect apples and peaches in NJ, PA, MD, WV, VA and MD and pears in

PA. a reasonable estimate of total bearing acreage that might be treated with bifenthrin is 63,550 acres.

Total maximum amount of pesticide to be used (in terms of a.i. and product): Based on the acreage estimated and applied at the **highest rate** requested on each product label, the total amount of pesticide that would be used is as follows:

Brigade 2EC: 28,597.5 lb a.i. or 1,830,240 fl. oz. formulated product
OR
Bifenture10DF: 28,597.5 lb a.i. or 285,375 lbs. formulated product

Use Season/Duration of use (period of time for which use of chemical is requested:

Date First Application Needed: First application on May 25
Date Last Application Needed: Last application on October 15, prior to harvest of the latest apple varieties.

Restricted Entry Interval (REI): Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.

Preharvest Interval (PHI): 14 days

Earliest possible harvest dates: NC peaches in mid-July; NC apples in late July

Additional Restrictions, User Precautions & Requirements, Qualifications of Applicators, etc.:

All applicable restrictions and requirements concerning the proposed use and the qualifications of applicators of Bifenthrin (Brigade 2EC, Bifenture 10DF) are as follows:

- The product, Bifenthrin (Brigade 2EC, Bifenture 10DF), (EPA not registered for apples or peaches /nectarines) may be applied

- Bifenthrin (Brigade 2EC, Bifenture 10DF) must be applied only by certified, licensed applicators or by persons under the direct supervision of a licensed applicator. The licensed applicator must be certified in the category applicable to the application of pesticides for insect control in pome and stone fruits.

- Applicators and other handlers must wear a long sleeved shirt and long pants, shoes plus socks, and chemical resistant gloves made of Barrier Laminate, Nitrile Rubber, Neoprene or Viton and protective eyewear.

- Do not apply within 14 days of harvest.

Alternative Methods of Control

Registered Alternative Pesticides:

Table 1. Insecticides registered for use in **one or more pome and/or stone fruit** that are at least somewhat effective against BMSB:

Class	**Active ingredient**	**Trade name(s)**
Organophosphate	azinphosmethyl	Guthion
	Chlorpyrifos	Lorsban and generics (pre bloom only)
Carbamate	Methomyl	Lannate
	formetanate hydrochloride	Carzol
Pyrethroids	beta-cyfluthrin	Baythroid XL and Leverage
	Bifenthrin	Bifenture
	Permethrin	Ambush, Perm-Up and others (pre bloom only)
	Fenpropathrin	Danitol
	gamma-cyhalothrin	Declare, Proaxis
	lambda-cyhalothrin	Warrior and generics, Voliam Xpress
	zeta-cypermethrin	Mustang Max
Neonicotinoids	Thiamethoxam	Actara
	Dinotefuran	Venom and Scorpion
	Clothianidin	Belay
Organochlorine	Endosulfan	Thionex

Most pome and stone fruit growers in eastern USA production regions have not yet implemented full-season programs targeting brown marmorated stink bug (BMSB), but many will need to do so following extensive crop injury in the worst affected regions in 2010 and similar but less reported damage in 2011. BMSB populations are rapidly spreading and increasing in size, and pose a significant threat throughout the fruiting period of pome and stone fruits. Known to be highly polyphagous and to utilize numerous cultivated and wild host plants, damaging BMSB populations are not restricted to a single crop or habitat, but occur on a landscape scale. The strong potential for ongoing re-invasion of orchards through harvest will necessitate aggressive intervention with a range of insecticides. Given that BMSB nymphs appear more susceptible to many insecticides than adults (Neilsen et al. 2008b), optimally effective, insecticide-based management of BMSB will require products that show evidence of rapid adult intoxication, from which bugs do not recover. Furthermore, these products should show evidence of strong residual activity and that adult BMSB will succumb to contact with or ingestion of dried residues.

Bioassay data suggest that individual, labeled products within chemical classes vary substantially in their relative effectiveness against BMSB (Appendix 1). Although as yet untested against BMSB under field conditions, the products that may prove to be most effective are relatively few in number and their utility within seasonal programs will be affected by label restrictions (e.g. seasonal maximum, preharvest interval) and the inherent qualities of some active ingredients (e.g. short residual activity) (see Discussion of Events or Circumstances which Brought About the Emergency Condition: Managing BMSB). Furthermore, many of the products showing the strongest potential against BMSB are known to be highly disruptive to biological control agents and Integrated Pest Management programs when used in the post-bloom period. Management of BMSB will require the use of the strongest products available. Bifenthrin has shown excellent activity against other stink bug species in US crops, is a key product used for BMSB management in Asian tree fruit production and has shown the strongest activity among the pyrethroids evaluated in laboratory bioassays with BMSB.

Brief justification:

Eastern tree fruit growers face an unprecedented threat from the new invasive BMSB and relatively limited effective labeled insecticide options for its management. Providing access to a product that has been shown in laboratory test to be nearly the most effective material against BMSB is expected to improve the probability of success in controlling BMSB. Bifenthrin has been used against BMSB in Asian tree fruit orchards and has shown excellent activity and residual efficacy against the pest in recent laboratory bioassays, unlike other available options. This product would provide an excellent option for growers to protect fruit in the in early to mid-season gap. This period of increased vulnerability is accentuated by the initial mass migrations into the orchard and when populations have begun to build in the orchard and would complement the recently exempted use of dinotefuran which is mostly used late season due to its short PHI. Bifenthrin is the most effective pyrethroid against BMSB with excellent residual activity and gives the best fit for early to mid-season control while providing an alternative to Endosufan which is to be removed from use this season in peaches and nectarines. Approval of a Section 18 petition for bifenthrin (Brigade 2EC, Bifenture 10DF) would compliment the dinotefuran section 18 exemption, as bifenthrinwould not be available for use close to harvest. Conversely, dinotefuran fills an important niche as the ONLY viable control tactic that would be available to growers for use near harvest. There is an urgent need for both of these efficacious products to be used to fill specific gaps in the season-long effort to provide adequate BMSB control.

Alternative Control Practices: There are no non-insecticidal, alternative control practices for BMSB.

Efficacy of Use Proposed Under Section 18

(Efficacy data should include statistical data on comparative Virginia registered products (or federally registered products that could be registered in Virginia for such use). This data should also compare the currently registered products to the proposed product. Effects on crop yield and quality should also be documented.)

There are no field data on the efficacy of bifenthrin against BMSB in apple and peach orchards in the United States. Published reports on the effectiveness of bifenthrin against BMSB in Asian orchards have not been translated or are not yet published, although it is understood that products containing bifenthrin are standard components of BMSB management programs there.

Laboratory bioassays examining the response of adult BMSB after 4.5 hours of exposure to dried insecticide residues on glass surfaces (Leskey et al, unpubl. data) showed that bifenthrin ranked very highly against adult BMSB compared to other products tested. 2). BMSB adults succumbed to exposure to dried bifenthrin residue with no bugs recovered from exposure over 7-days, and mortality after 7 days was highest. This is in contrast to other pyrethroid products, where stink bugs were shown to recover after initial treatment and/or exposure on a much more regular basis.

Kuhar (in press.) used a dipped green bean bioassay to evaluate the toxicity of a range of products to both adult and nymphal BMSB. (Appendix 3) shows data from adult BMSB assays, which involved continuous exposure to residues and enabled feeding on bean with 100% mortality.

In general, the results from these two studies, which differed substantially in method and duration of exposure, demonstrate that bifenthrin has exceedingly good efficacy against this pest, which is otherwise very difficult to control with available registered products.

(Efficacy data and/or other references included as separate attachment(s))

Expected Residue Levels in Food

Expected residue level of this product will not exceed the established tolerance for pears, as the proposed rate of application, re-treatment interval, and pre-harvest interval is the same as what is already approved for pears

(Residue data included as separate attachment)

Discussion of Risk Information

(Potential risks to human health, endangered or threatened species,
beneficial organisms, and the environment)

Description of application sites, including proximity to residential areas, aquatic systems, endangered or threatened species habitats, soil types, etc.:

Application sites will be restricted to commercial apple peach/nectarine orchards in NJ, PA, DE, MD, WV, VA and NC. Proximity of these sites to residential areas, aquatic systems or endangered or threatened species habitats, soil types, etc. will vary by site and by state.

Possible risks posed by the user:

The following is copied directly from specimen labels (attached) for (Brigade 2EC and Bifenture 10DF) Insecticides. Also please refer to attached MSDS for Brigade 2EC and Bifenture 10DF .

ENVIRONMENTAL HAZARDS

This pesticide is toxic to fish and aquatic invertebrates. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not apply when weather conditions favor drift from treated areas. Drift and runoff from treated areas may be hazardous to aquatic organisms in water adjacent to treated areas. Do not contaminate water when disposing of equipment wash waters.

This product is toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not allow it drift to blooming crops or weeds while bees are actively visiting the treated area. The use of bifenthrin is prohibited in areas that may result in exposure of endangered species to bifenthrin. Prior to use in a particular county contact the local extension service for procedures and precautions to use to protect endangered species.

Proposals to mitigate risks: Reference specimen labels (attached)

Coordination with Other Affected Federal State, and Local Agencies

(List of endangered or threatened species from the USFWS included as a separate attachment)

Threatened and Endangered Species in New Jersey

The list of Federal and State threatened and endangered species for New Jersey can be found at the following websites: http://ecos.fws.gov/tessyublicfTESSWebpageUsaLists?state=nj and

Endangered Species in NJ
From the NJ Division of Fish and Wildlife, NJDEP
http://www.state.nj.us/dep/fgw/tandespp.htm

Endangered Species are those whose prospects for survival in New Jersey are in immediate danger because of a loss or change in habitat, over-exploitation, predation, competition, disease, disturbance or contamination. Assistance is needed to prevent future extinction in New Jersey.

Threatened Species are those who may become endangered if conditions surrounding them begin to or continue to deteriorate.

There are other classifications for wildlife as well, including Stable, Species of Special Concern Special Concern and Undetermined.

Species names in the below tables link to PDF documents containing identification, habitat and status and conservation information. Additionally, in 2003 twelve species were highlighted as part of the celebration of the 30th anniversary of the NJ Endangered Species Conservation Act. See

the "2003 Species of the Month" page for more information.			
BIRDS			
Endangered		**Threatened**	
Bittern, American BR	*Botaurus lentiginosos* BR	Bobolink BR	*Dolichonyx oryzivorus* BR
Eagle, bald BR	*Haliaeetus leucocephalus* BR	Eagle, bald NB	*Haliaeetus leucocephalus* NB
Falcon, peregrine	*Falco peregrinus*	Hawk, Cooper's	*Accipiter cooperii*
Goshawk, northern BR	*Accipiter gentilis* BR	Hawk, red-shouldered NB	*Buteo lineatus* NB
Grebe, pied-billed	*Podilymbus podiceps*	Night-heron, black-crowned BR	*Nycticorax nycticorax* BR
Harrier, northern BR	*Circus cyaneus* BR	Night-heron, yellow-crowned	*Nyctanassa violaceus*
Hawk, red-shouldered BR	*Buteo lineatus* BR	Knot, red BR	*Calidris canutus* BR
Owl, short-eared BR	*Asio flammeus* BR	Osprey BR	*Pandion haliaetus* BR
Plover, piping**	*Charadrius melodus***	Owl, barred	*Strix varia*
Sandpiper, upland	*Batramia longicauda*	Owl, long-eared	*Asio otus*
Shrike, loggerhead	*Lanius ludovicianus*	Rail, black	*Laterallus jamaicensis*
Skimmer, black BR	*Rynchops niger* BR	Skimmer, black NB	*Rynchops niger* NB
Sparrow, Henslow's	*Ammodramus henslowii*	Sparrow, grasshopper BR	*Ammodramus savannarum* BR
Sparrow, vesper BR	*Pooecetes gramineus* BR	Sparrow, Savannah BR	*Passerculus sandwichensis* BR
Tern, least	*Sterna antillarum*	Sparrow, vesper NB	*Pooecetes gramineus* NB
Tern, roseate**	*Sterna dougallii***	Woodpecker, red-	*Melanerpes erythrocephalus*

		headed	
Wren, sedge	*Cistothorus platensis*		
**Federally endangered or threatened			
BR - Breeding population only; NB - non-breeding population only			

REPTILES			
Endangered		**Threatened**	
Rattlesnake, timber	*Crotalus h. horridus*	Snake, northern pine	*Pituophis m. melanoleucus*
Snake, corn	*Elaphe g. guttata*	Turtle, Atlantic green**	*Chelonia mydas***
Snake, queen	*Regina septemvittata*	Turtle, wood	*Clemmys insculpta*
Turtle, bog**	*Clemmys muhlenbergii***		
Atlantic hawksbill**	*Eretmochelys imbricata***		
Atlantic leatherback**	*Dermochelys coriacea***		
Atlantic loggerhead**	*Caretta caretta***		
Atlantic Ridley**	*Lepidochelys kempi***		
**Federally endangered or threatened			

AMPHIBIANS			
Endangered		**Threatened**	
Salamander, blue-spotted	*Ambystoma laterale*	Salamander, eastern mud	*Pseudotriton montanus*

Salamander, eastern tiger	*Ambystoma tigrinum*	Salamander, long-tailed	*Eurycea longicauda*
Treefrog, southern gray	*Hyla chrysocelis*	Treefrog, pine barrens	*Hyla andersonii*
INVERTEBRATES			
Endangered		**Threatened**	
Beetle, American burying**	*Nicrophorus mericanus***	Elfin, frosted (butterfly)	*Callophrys irus*
Beetle, northeastern beach tiger**	*Cincindela d. dorsalis***	Floater, triangle (mussel)	*Alasmidonta undulata*
Copper, bronze	*Lycaena hyllus*	Fritillary, silver-bordered (butterfly)	*Bolaria selene myrina*
Floater, brook (mussel)	*Alasmidonta varicosa*	Lampmussel, eastern (mussel)	*Lampsilis radiata*
Floater, green (mussel)	*Lasmigona subviridis*	Lampmussel, yellow (mussel)	*Lampsilis cariosa*
Satyr, Mitchell's (butterfly)**	*Neonympha m. mitchellii***	Mucket, tidewater (mussel)	*Leptodea ochracea*
Skipper, arogos (butterfly)	*Atrytone arogos arogos*	Pondmussel, eastern (mussel)	*Ligumia nasuta*
Skipper, Appalachian grizzled (butterfly)	*Pyrgus wyandot*	White, checkered (butterfly)	*Pontia protodice*
Wedgemussel, dwarf**	*Alasmidonta heterodon***		

**Federally endangered or threatened

MAMMALS	
Endangered	
Bat, Indiana**	*Myotis sodalis***
Bobcat	*Lynx rufus*
Whale, black right**	*Balaena glacialis***
Whale, blue**	*Balaenoptera musculus***
Whale, fin**	*Balaenoptera physalus***
Whale, humpback**	*Megaptera novaeangliae***
Whale, sei**	*Balaenoptera borealis***
Whale,sperm**	*Physeter macrocephalus***
Woodrat, Allegheny	*Neotoma floridana magister*
**Federally Endangered	

FISH	
Endangered	
Sturgeon, shortnose**	*Acipenser brevirostrum***
**Federally Endangered	

Effect of bifenthrin on endangered species:

According to the National Pesticide Information Center Bifenthrin Fact Sheet (http://npic.orst.edu/factsheets/biftech.pdf), bifenthrin is low in toxicity to birds. There are potential risks for birds and mammals that eat aquatic organisms because bifenthrin may accumulate in fish. Bifenthrin is highly toxic to fish and small aquatic organisms. It is also very highly toxic to bees. However, bifenthrin is not likely to reach groundwater because it binds tightly to soil.

The habitat of the whales, sea turtles, piping plover, roseate tern, Tiger Beetles, and Dwarf Wedge mussel are not in areas where pome and stone fruit are grown. The use of bifenthrin is not likely to have any significant negative effects on those organisms.

The NJDEP will provide guidance Rutgers University / New Jersey Agricultural Experiment Station's Cooperative Extension Service and growers on limiting applications of the pesticide product, ranging from (1). Do not apply directly to water; (2). Do not use within 20 yards of the water's edge for ground applications, nor within 100 yards for aerial application; and (3). Do not use within 100 yards of the water's edge for ground application, nor within ¼ mile for aerial applications. This should afford protection to state species of concern.

Education is a critical component of any enforcement program. The Department relies strongly on the educational outreach provided by the Rutgers University / New Jersey Agricultural Experiment Station's Cooperative Extension Service. The Extension Service will inform Extension Agents of the Emergency exemption program requirements and the guidelines which growers and applicators must follow when using bifenthrin insecticide. Extension personnel will be available to answer questions which might arise regarding procedures of application.

Enforcement Program

(Explanation of legal authority and program resources for enforcement)

Include Description of the Enforcement Program, and Procedures for assuring Compliance:

The New Jersey Department of Environmental Protection has been granted authority to administer and carry out legislative intent and enforcement measures related to the regulation and use of pesticides in the state. The New Jersey Department of Environmental Protection Pesticide Control Program carries out an efficient and effective pesticide program, complying with the intent of FIFRA regulations.

The NJDEP would plan to conduct routine pesticide use investigations pertaining to the use of pesticides under section 18 emergency exemption registrations and respond to all complaints of misuse. The New Jersey Department of Environmental Protection will take appropriate steps to ensure that the conditions of this exemption are met.

Specific exemptions may be granted by the Environmental Protection Agency pursuant to FIFRA Section 18 and 40 CFR Part 166. The Department has the authority and responsibility to enforce any special requirements that EPA might see fit to impose on an approved Section 18 label. The proposed use of dinotefuran under this Emergency exemption request will be monitored by the New Jersey Department of Environmental Protection.

Education is a critical component of any enforcement program. The Department relies strongly on the educational outreach provided by the Rutgers University / New Jersey Agricultural Experiment Station's Cooperative Extension Service. The Extension Service will inform Extension Agents of the Emergency exemption program requirements and the guidelines which growers and applicators must follow when using dinotefuran insecticide. Extension personnel will be available to answer questions which might arise regarding procedures of application.

Repeat Uses

If use being requested is a repeat use, and the final report has not been filed, include the interim report as a separate attachment

Progress Toward Registration

Information from the registrant concerning current status)
(Not Required for Request for a Quarantine Exemption)

[X] NO APPLICATION FOR REGISTRATION OF THE USE IS UNDER REVIEW BY USEPA.

[ ] USEPA IS REVIEWING AN APPLICATION FOR REGISTRATION OF THIS USE (TYPE OF REGISTRATION ___________________________).

[X] AN IR-4 PETITION FOR TOLERANCE IS BEING DEVELOPED OR IS UNDER REVIEW BY USEPA.
PETITION # IR-4 PR No. 09548

[ ] A PETITION FOR TOLERANCE HAS BEEN SUBMITTED TO USEPA BY THE MANUFACTURER.
PETITION # ___________________________

[ ] A PETITION FOR TOLERANCE OR AN APPLICATION FOR REGISTRATION HAS BEEN DENIED (INDICATE THE CIRCUMSTANCES ____).

IF THIS USE PATTERN WILL BE NEEDED FOR MORE THAN ONE SEASON, A PERMANENT TOLERANCE SHOULD BE PURSUED IMMEDIATELY. CONTACT THE MANUFACTURER OR IR-4 TO INITIATE THE ESTABLISHMENT OF A PERMANENT TOLERANCE.

SPECIFIC EXEMPTION BASIS:
Significant Economic Loss

Discussion of Events or Circumstances Which Brought About the Emergency Condition

If this use is for a crop, include a detailed description on such things as the crop biology, crop threshold level to the pest, etc. Also, indicate origin of pest, means of its introduction, and spread into the area (if known):

If this use is for a crop, include a detailed description on such things as the crop biology, crop threshold level to the pest, etc. Also, indicate origin of pest, means of its introduction, and spread into the area (if known):

Invasion and spread of BMSB in the US. BMSB is an invasive stink bug that is native to Japan, Korea, Taiwan, and China and that was officially identified in the USA in 2001 from specimens collected in Allentown, PA in the late 1990's (Hoebeke and Carter 2003). Large and damaging populations are now established in parts of PA, NJ, DE, MD, WV, VA and NC. Letters in support of this petition from participating state Departments of Agriculture (see attached) reflect the severity of the problem and the significant levels of concern being expressed by members of the tree fruit and other agricultural industries in each state. Established BMSB populations have recently been detected in CA, CT, IN, KY, NH, NY, OH, OR, RI, and TN, though crop losses have been minimal at this early stage of infestation. Additional states in which BMSB has been detected include AL, AZ, FL, GA, IA, IL, KS , ME, MI, MN, MS, NE, NM, RI, SC, TX, VT, WA, and WI, and further detections and range expansion of BMSB are anticipated in 2012 and beyond.

It appears that BMSB populations in the Mid-Atlantic region have increased in size and distribution in the absence of any natural factors that might otherwise have suppressed their growth and spread. Limited surveys of native natural enemies of BMSB over the last six years have revealed levels of egg and adult parasitism that are typically less than 5% (K. Hoelmer, unpubl. data). Native natural enemies recorded to date include specialist Pentatomid parasitoids in the orders Hymenoptera (*Trissolcus* spp.; egg parasitoid), and Diptera (*Trichopoda* spp.; lays eggs on adults, although none have developed on BMSB) (K. Hoelmer, unpubl. data). Foreign exploration has identified several species of *Trissolcus* egg parasitoids that appear to be promising biological control agents, typically causing 50-80% parasitism of BMSB in Asia. At least four of those species are in culture at the USDA-ARS quarantine facility in Newark, DE, and while classical biological control may eventually provide a promising long-term solution, possible implementation of this approach will require at least several more years of host range testing and other evaluations.

Host range. Another factor likely associated with the recent spread and growth of BMSB populations in the Mid-Atlantic region is its highly polyphagous habit; over 300 host plants have been noted in Asia. Crops mentioned in the Asian literature as being susceptible to attack broadly include tree fruits, vegetables, shade trees, and leguminous crops, with specific mention of apple, cherry, peach, pear, citrus, lima beans, and fig (Panizzi et al. 2000, Hoebeke and Carter 2003). Surveys conducted in the United States identified a number of tree fruit crops that serve as hosts for BMSB, including apple, plum, peach, pear and cherry (Bernon 2004, Nielsen and Hamilton 2009a, b).

Impact of BMSB on orchard crops in 2010. In 2010, BMSB emerged suddenly as a pest of unprecedented importance in tree fruit and other crops in the Mid-Atlantic region. USDA NASS (2011) statistics for 2010 show 63,550 acres of bearing pome (apple, pear) and stone (peach) fruit among the states participating in this petition. Statistics for Delaware and for other stone fruit crops were not provided. Statistics for pear were provided only for Pennsylvania. The estimated value of utilized production of apples, pears and peaches in 2010 was $242,311,000. Anecdotally, relative levels of injury to Mid-Atlantic tree fruit crops in 2010 varied among regions, among orchards within a region, and among individual blocks within farms. The factors underlying this variation are as yet unknown, but may be due to one or more of the following, 1) differences in pest pressure, 2) differences in susceptibility among varieties, 3) differences in the specific location of individual blocks (e.g. relative to external sources of BMSB), and 4) differences in management programs. Although BMSB populations are currently considered to be highest in parts of WV, MD, northern VA and some counties in central VA, damaging populations were observed in parts of PA, NJ, southwest VA and NC in 2010. In the worst affected areas, some peach orchards experienced 100% fruit loss and apples in some orchards showed >50% injury. Counties in northern VA are considered to be at the leading edge of the heaviest BMSB pressure, although established populations in other states in the region will likely increase in size and expand their geographic range on an ongoing basis.

BMSB feeding injury. BMSB has piercing-sucking mouthparts that are inserted through the fruit skin into the flesh to extract fluids. Feeding on peach fruit results in gummosis (i.e. extrusion of a thick, translucent gel at injury sites on the surface) and sunken, misshapen areas on the fruit surface known as “catfacing”. Internally, BMSB causes discrete discolored, corky and/or hollow areas in peaches that may or may not correspond with surface injury and that may extend to the pit. When not associated with visible external injury, this internal damage is especially problematic in that apparently uninjured fruit at harvest are found to be unmarketable only after cutting or biting into them. In apples, BMSB feeding causes a range of surface injuries that may be associated with the time at which feeding occurs and/or the variety and that may progress as fruit mature (Leskey et al. 2009). The most apparent external injury is manifest as shallow depressions with or without discoloration. Internally, apples show discrete areas of brown, corky flesh that may extend to the core. This injury is similar to that induced by feeding of the native stink bug species and that, in the past, has likely been misdiagnosed as a physiological disorder associated with calcium deficiency, known as cork-spot (Brown 2003). Another major effect of BMSB feeding that emerged in 2010 was the expression of post-harvest injury by apples. Fruit that had been deemed damage-free and graded at packinghouses subsequently showed areas of brown discoloration on the fruit surface after a period in cold-storage, adding unexpected and significant economic loss. Although not yet systematically evaluated, this injury may have been due to feeding late in the season, during the final weeks before harvest. Injury expression in pears is similar to that in apples. Among the stone fruit, injury in apricots and nectarines is likely to be similar to that in peaches, although the manifestation of injury by plums and cherries has not yet been well described.

Monitoring BMSB. Monitoring tools are typically used by growers to assess the presence, abundance, and seasonal activity of a pest to determine the need for and timing of insecticide applications. Aldrich et al. (2007) and Khrimian et al. (2008) confirmed that the aggregation pheromone of the Asian brown-winged green bug, *Plautia stali* Scott, methyl (2*E*,4*E*,6*Z*)-decatrienoate (Sugie et al. 1996), is cross-attractive to BMSB, as was previously reported in Asia (Tada et al. 2001 a, b, Lee et al. 2002). Although this compound reliably attracted BMSB nymphs to ground-deployed pyramid traps in the Mid-Atlantic in 2010 (Leskey et al., 2012), adults are attracted to it only very early (Tada et al. 2001a) and late in the season (Leskey et al., 2012, Tada et al. 2001a, Khrimian et al. 2008). Thus, identification of the specific BMSB aggregation pheromone season is crucial and the subject of on-going research at USDA ARS, Beltsville, MD. Native stink bug species have been monitored effectively in tree fruits using yellow ground- and tree-deployed pyramid traps baited with methyl (2*E*,4*Z*)-decadienoate (Leskey and Hogmire 2005, Hogmire and Leskey 2006) and in vegetable and row crops using black light traps (Kamminga et al. 2009). Although black light traps have been evaluated for BMSB monitoring in

Japan (Moriya et al. 1987) and New Jersey (Nielsen and Hamilton 2009a) and ground-deployed black pyramid traps baited with methyl (2*E*,4*E*,6*Z*)-decatrienoate were tested in commercial orchards in WV, MD, VA, NJ, and PA in 2010 (Leskey et al., 2012), these preliminary studies did not attempt to relate captures to crop injury and there is currently no system to effectively and reliably monitor BMSB in any cropping system.

Managing apple and peach pests. Given that peaches and apples represent the vast majority of tree fruit acreage in production in the seven states participating in this petition, a discussion of pest management practices will be confined to those crops. Prior to the invasion of BMSB, apple and peach growers devised seasonal programs in response to several direct pests (i.e. those that lay eggs and/or feed on fruit) and a number of secondary pests (i.e. those that do not feed on fruit). While the pest complex and relative importance of individual direct and secondary pests varies among states and regions, some generalities can be made. The most damaging direct pests that overlap both crops include oriental fruit moth, plum curculio, tarnished plant bug, several species of leafroller and San Jose scale. In peaches, native stink bugs species are typically more problematic than in apples. Additional direct pests of apples that usually require annual intervention include codling moth, rosy apple aphid and apple maggot. Mites (i.e. European red mite and two-spotted spider mite) are potentially serious secondary pests of apple but are typically not as problematic in peaches. A number of other secondary pests can impact apple and peach production, but are generally managed well by the insecticides used to target the direct pests. In general, 7-8 pesticide applications per year are required to manage insect and mite pests in peaches, while 8-11 applications per year are used in apples, depending on pest pressure, variety (i.e. harvest date) and use of other tactics (e.g. mating disruption). Growers typically rotate their annual insecticide applications among several chemical classes, according to the pest(s) targeted at various points in the season. It is important to note that BMSB is significantly more difficult to kill then other stink bugs. For this reason adding bifentrin, which is significantly more effective, with better residual on BMSB than most other pyrethrioids, to the growers toolbox could limit the applications of the less effective pyrethroids with bifenthrin being used strategically at specific times in the season when BMSB pressure is greatest.

The Food Quality Protection Act (FQPA) of 1996 provided the impetus for eastern tree fruit growers to begin the transition away from conventional insecticides and pest management programs and the adoption of new tactics and strategies. In concert, the availability of new, highly efficacious "reduced risk" and "organophosphate replacement" insecticides and the increasing use of non-insecticidal options (e.g. mating disruption) and decision tools (e.g. pheromone based monitoring, degree-day phenology models) for managing orchard pests has advanced the actual practice and practically of Integrated Pest Management (IPM) tremendously in the last decade.

Managing BMSB. Unfortunately, many of the newer insecticides are not effective against stink bugs in general and management of BMSB is likely to be further complicated by the tremendous season-long pressure that high populations can exert. Since BMSB is a newly established pest, there is a profound lack of background data from field studies with which to devise sustainable management programs that will target it and the other key pests needing intervention. Although mating disruption for oriental fruit moth and/or codling moth remains an option, insecticides will be essential to BMSB management in tree fruit orchards unless and until alternative strategies and tactic are developed.

Some growers who experienced early problems with BMSB in 2009 initiated targeted programs against it early in the 2010 season, while many others began to respond to BMSB somewhat later in 2010, upon realizing the magnitude of the pest pressure. In both scenarios, growers used their experience, Cooperative Extension recommendations for native stink bugs, and business acumen to select products that they felt would provide effective and affordable fruit protection. Still, many of them suffered major injury and economic loss at harvest. This was likely due at least in part to their product selections, which occurred in the absence of sufficient field or laboratory data on how individual products might perform relative to others at the application rates and timings used. In retrospect, based on the results of laboratory assays (see below), many of the products used in 2010 would not have been expected to be the strongest options for BMSB. Furthermore, growers who began responding later in the season may have incurred prior injury that exacerbated their losses at harvest.

Many registered compounds that are or are not labeled for use in one or more tree fruit crops have now been evaluated against BMSB in laboratory assays. Nielsen et al. (2008b) developed LC_{50} values for adults and nymphs, while Leskey et al. (submitted) and Kuhar (unpubl. data) screened a wider range of products presented to adult BMSB, respectively, as dry residue on glass surfaces (4-hour exposure) and dry residue on green beans (continuous exposure over several days). Trials at the USDA ARS (Leskey et al. submitted) have provided the most comprehensive evaluation of products to date (Appendix 1), and results from those assays are those discussed in most detail, below.

Although their relative performance against BMSB under field conditions is still being established, a number of products from different chemical classes showed good to excellent activity. The ten most effective compounds were, in descending order; dimethoate, malathion, bifenthrin, methidathion, endosulfan, methomyl, chlorpyrifos, acephate, fenpropathrin and permethrin
(Appendix 1). However, product registrations and legal restrictions preclude or significantly diminish the utility of nine of these products against BMSB in apples and/or peaches, especially given that BMSB management will need to occur in the post-bloom period. These restrictive factors are as follows:

Product labels

- Dimethoate and acephate are not labeled for use in either crop.
- Malathion is labeled only for peaches
- Methidathion is labeled only for apples.
- Endosulfan will be phased out in peaches on July 31, 2012 and in apples on July 31, 2015

Label restrictions (application timing)

- Chlorpyrifos and methidathion cannot be applied as a foliar spray after bloom
- Permethrin cannot be applied in apples after petal-fall

Inherent characteristics of individual insecticides or insecticide classes will further influence the performance, utility or overall impacts of some, as follows:

- Malathion and methomyl are known to have very short residual activity in the field.
- Pyrethroids and methomyl are highly toxic to the arthropod natural enemies of insect and mite pests of orchards.

Thus, among the USDA ARS bioassays bifenthrin ranked 3rd in efficacy against adult BMSB. Among these top ten materials, only fenpropathtrin can be used on apples and peaches (Appendix 1). Thus, growers are highly restricted in terms of material selections against BMSB. Other insecticides that apple and/or peach growers have relied on for relatively broad spectrum control of orchard pests (e.g. phosmet, acetamiprid, thiacloprid) showed poor activity against BMSB adults in USDA ARS laboratory bioassays.

The USDA ARS data have provided strong indications that individual active ingredients within a chemical class vary substantially in their effectiveness against BMSB and that product selection will need to be based heavily on active ingredient. In laboratory trials (Nielsen et al. 2008b, Leskey et al., unpubl. data) and from preliminary field studies (Leskey 2011), BMSB adults have been observed to show quick initial "knock-down" following exposure to some pyrethroids and then to recover after a period of intoxication. In the field, >33% of moribund adult BMSB recovered after direct exposure to cyfluthrin, and in commercial orchards BMSB recovery rates of up to 80% following insecticide exposure were reported.

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The narrow range of efficacious insecticides for managing BMSB in apple and peach orchards is an extremely serious issue for growers and their advisors, especially given the need to simultaneously control the other direct and indirect pests. It appears inevitable that products known to be disruptive to IPM and biocontrol (e.g. methomyl, pyrethroids) will factor heavily in seasonal programs for BMSB. Use of these products at the rates, timing and frequency needed to control BMSB will undoubtedly cause outbreaks of one or more secondary pests in many orchards, leading to additional insecticide and miticide applications. Having bifenthrin which is significantly more effective than the other pyrethrioids with better residual activity when compared to other materials in the growers' toolbox could reduce the number of less effective pyrethroid applications.

Bifenthrin has been used against BMSB in Asian tree fruit orchards and has shown excellent activity against the BMSB in recent laboratory bioassays. Cooperative Extension Service personnel have long recommended the avoidance of certain products or classes (e.g. pyrethroids) after a certain point in the season, due to their known disruptive effects on beneficial arthropods and the potential to incite secondary pest outbreaks. The secondary pests of greatest concern include San Jose scale and mites in apples and peaches, and woolly apple aphid in apples, although major disruption of biocontrol agents could cause unexpected additional secondary pest outbreaks. To avoid this situation the section 18 for dinotefuran (neonicotinoid) which can be used in the later season, greatly compliments the mid-season use of bifenthrin.

Bifenthrin will provide an excellent option for growers as an early to midseason product due to the lack of products that are as effective chemical options for BMSB control and in many cases, where control efforts are especially aggressive, an additional tool to rely on as use of other available chemicals approaches the labeled seasonal maximum for application rates. The mid-summer period is a time when BMSB pressure is increasingly imposing. Fruit becomes increasingly vulnerability as the initial migrations of BMSB move into the orchard from overwintering sites but also again when producers face the potentially relentless pressure mid-season when nymphal populations have the potential to build in orchards while at the same time migrating first generation adults have begun to move into the orchard from the unmanaged areas which can continue to harvest. Later season control options will certainly be enhanced as the section 18 for dinotefuran (neonicotinoid) comes into play. However, BMSB control will doubtlessly be enhanced as the option of earlier season bifenthrin use would complement the dinotefuran section applications that are made close to harvest, due to its short PHI.

The need for bifenthrin will be accentuated on peaches and nectarines in 2012 as endosulfan is removed from the market. Bifenthrin availability in mid-Atlantic orchards will be critical to fill the mid-season gap that will be created as Endosulfan is removed from use. Another potential compliment between these section 18's is the relatively low cost of bifenthrin. Use of bifenthrin earlier in the season may help to offset the extremely high cost of applying dinotefuran at the end of the season. Clearly, tree fruit growers in regions affected by BMSB need all possible management options and tools if they are to remain productive and viable in the long term. Access to bifenthrin would be an important step in meeting that urgent and immediate need. Furthermore, given the emerging national issue with BMSB, experience with seasonal programs including bifenthrin in eastern tree fruits could translate directly to its management in the same and other crop systems that may be risk elsewhere in the USA.

Discussion of Economic Loss

The extent of BMSB injury to Mid-Atlantic tree fruit crops in 2010 was not fully understood until well after fruit had been harvested, due to a number of factors. Some growers who experienced injury did not recognize it as being associated with BMSB until after harvest. Since mature peaches can express internal injury that is not necessarily manifest externally, some peach producers learned of poor internal fruit quality only after having sold fruit to distributors or processors. An especially significant factor in apples was the expression of injury only after a period in cold storage. Consequently, in combination, these factors preclude the ability to accurately quantify injury and direct economic losses for the 2010 season.
Figures 1 and 2 show fruit injury data from six West Virginia and Maryland peach and apple orchards, respectively, from which 100 fruit were destructively sampled from border and interior rows at weekly intervals from July 23 – October 6 (apples) and July 23 – August 20 (peaches)in 2010 and season long in 2011 (Leskey et al., unpubl. data). All fruit were evaluated for the presence and severity of internal injury from BMSB by thin-sectioning them to the core or pit. Injury severity values represent the number of discrete areas of internal injury recorded. Qualitative indications of pest pressure from BMSB in each orchard were based on individual grower perceptions of the size of overwintering populations in fall 2009. The relative "aggressiveness" of the insecticide programs used in each orchard was based on spray records and

on whether individual growers specifically targeted BMSB through much of the 2010 growing season. Injury to both apple and peach fruit was excessive in all blocks, regardless of the perceived size of the overwintering population or the extent to which each grower specifically targeted BMSB in 2010. Leskey etal. Impact of the Invasive Brown Marmorated Stink Bug, Halyomorpha halys (Stål) in Mid-Atlantic Tree Fruit Orchards in the United States: Case Studies of Commercial Management submitted.

Although tree fruit producers in the mid-Atlantic region are acutely aware of the threat posed by H. halys and, in most cases, responded to it aggressively in 2011, our study revealed substantial injury to late-season apple varieties, ranging from 4.4 to 74.6% among the 18 orchards (mean percentage injury = 32.4 ± 4.9 SE). The economic consequences of this would vary according to the nature and severity of the injury, and to the market destination of the fruit, but it is clear that current management tactics and tools did not provide adequate crop protection in most situations. (Joseph et al., unpubl. data).

While region-wide, the injury observed was not as severe in 2011 as 2010, growers treated much more aggressively, increasing their overall costs in terms of materials, fuel, time, labor, and equipment maintenance. We did see substantial pressure throughout the season. Growers who backed off at all soon were experiencing increasing injury. Damage information from grower surveys for 2011 were varied but still had significant impact on many businesses, with damage still largely exceeding 20% in many cases, in spite of these increasingly aggressive applications targeting this pest. (Appendix 2.)

Dr. Chris Bergh Extension Entomologist with Va. Tech compiled the following summary of BMSB impact to Mid-Atlantic tree fruits in 2011 which was obtained from fruit processors and the National Peach Council. Quantifying the regional economic impact of BMSB injury to pome and stone fruit following the 2011 season proved to be virtually impossible due to, 1) a general lack of BMSB-specific injury records, 2) an unknown overall impact on the grading and value of BMSB-injured fruit received by processors, and 3) to a lack of data on wholesale and direct market value losses. Information provided by the various source is as follows:

Knouse Foods (March 14, 2012) (apples) "…classified 40,000 bushels (out of 9 million receipts) as having stink bug damage. We all know that this is an unrealistically low number caused in part by the newness of this and our classification system, but also because this year's crop was a particularly dirty crop (scab, hail, sooty blotch and fly speck). My guess is that much of these covered up or distracted from stink bug damage." Knouse Foods receives fruit from at least one state (NY) in which BMSB is not currently prevalent.

Rice Fruit (April 10, 2012) (apples) "…The 2011 crop damage is greatly reduced from the frequently seen 30% damage levels on the 2010 crop. We don't know the reasons why the damage was less, but we do know that through the strong educational efforts of many researchers, many specific sprays were applied for the insect. Majority of fruit received from growers near Gettysburg, PA, with some from MD and NY."

National Peach Council (April 10, 2012) (stone fruit) "2011 crop damage ranged from 5 to 22%, due to the feeding damage caused by this pest. The states continuing to feel the largest impacts of BMSB are MD, VA, and PA, with NJ closely behind. …overall production costs, due to increased use of spray materials to combat BMSB and the current labor situation, mitigated any actual bottom line gains to peach producers in 2011."

A study involving entomologists from several institutions was conducted in fall 2011 to measure the distribution of BMSB injury to late season apples in commercial apple orchards in VA, MD, PA and NJ. Fruit samples were taken from the top, middle, and lower canopy of trees in border, interior, and intermediate orchards zones in 18 orchards just before commercial harvest of the selected varieties, and assessed for external and internal injury from BMSB. Across the orchards, total BMSB injury ranged from 4.4 to 74.6% (mean = 32.4 ± 4.9SE). The orchard in which the highest injury was recorded was located near Winchester, VA, and involved a grower who took a "wait and see" approach to BMSB management.

In 2011, large numbers of adults moving from overwintering sites began to target the developing peach fruit and by 1 June (~ 30 mm diameter fruit); two orchards had already recorded over 20% damage.(Leskey etal, 2012) In 2010, early-season feeding by adults led to devastating injury to peach growers in many mid-Atlantic states (Leskey, T.C. and G.C. Hamilton. 2011.) In summary, BMSB injury was lower overall in 2011 than in 2010, and varied widely among states and orchards. Although lower levels of fruit injury in many orchards likely reduced the direct economic impact of BMSB, the increased cost of spray programs was widely reported. Some states within the region (e.g. NC and NY) continued to report low levels of injury, while highest injury reports continued to be from areas most heavily impacted in 2010. While it is still early to get a good idea of widespread state-by-state damage estimates for 2011, anecdotal evidence and preliminary data summaries have indicated several instances where yield losses easily still exceeded 20%.

Use of three-tier approach to determine if SEL has occurred or will occur. An SEL can be justified if:

A. Tier 1-Yield Loss of at least 20%:

- Compare expected yield under pest emergency with non-emergency three-year average yield.
- Yield under pest emergency estimated using the most effective available alternative control (chemical or non-chemical).
- Average yield loss per acre for crop, not worse case scenario. Data from economic injury studies or comparative efficacy studies taken on yield. Industry field trials can be used.
- Efficacy data to support expected yield loss using available pest control alternatives.

Example Table for Documenting Tier 1 Yield Loss

Tier 1-Yield Loss				
Treatment	**Percent Control of Pest (efficacy)**	**Percent Crop Injury**	**Yield per Acre**	**Percent Change Compared to Three-year Average Yield**
Bifenthrin	**92%**	**<20**	**495 apple 135 peach**	**<20% reduction**
Lambda-cyhalothrin	**52%**	**>50%**	**250 apple 75 peach**	**50% reduction**
Fenpropathrin	**42%**	**>60%**	**200 apple 60 peach**	**60% reduction**
Phosmet	**20%**	**>90%**	**50 apple 15 peach**	**90% reduction**
Untreated	**---------------**	**100%**	**0**	**Total loss**

If Tier 1 criteria is not met, then Tier 2 criteria can be considered:

B. Tier 2-Loss of at least 20% of gross revenue:

- Compare gross revenue from crop grown under normal conditions versus gross revenue under emergency conditions when the best alternative chemical is used to control the pest.
- Pest emergency crop revenue determined as crop average revenue, not the worst case scenario.
- Supporting information-Yield loss from Tier 1 evaluation and
- Baseline yield, Price (by end market), and losses to gross revenue due to quality (shift in grade or price reduction) and/or added production costs (e.g., sorting or repacking costs, additional pest control costs).
- Information from national or state Agricultural Statistics Services (NASS or SASS) reports, crop reports, market surveys, futures market, university crop production costs analysis, can be used.

Example Table for Documenting Tier 2 Gross Revenue Loss

Tier 2-Gross Revenue Loss				
Crop	**Baseline-average yield without pest emergency**	**Pest Emergency-average yield with best alternative control measure**	**Difference Between Baseline & Emergency**	**Percent Change**
Yield/acre				
Price per unit				
Gross revenue				

If Tier 1 and Tier 2 criteria cannot be met, then Tier 3 criteria can be considered:

C. Tier 3-Loss of at least 50% of Net Operating Revenue:

- Compare the Net Operating Revenue expected with the pest emergency using the best control alternative and average loss for the crop to the non-emergency Net Operating Revenue.
- Net Operating Revenue = Gross Revenue – Variable Operating Costs.
- Variable Operating Costs – Includes annual purchased inputs: hired labor, fertilizer, fuel, pesticides, seed, other materials, etc. It does not include the cost of or depreciation of machinery, land costs, taxes other overhead.
- Information from grower surveys, university crop production costs analysis, etc. can be used.

Example Table for Documenting Tier 3 Percent Loss of Net Operating Revenue

Tier 3-Percent Loss of Net Operating Revenue				
Crop	**Baseline-average yield without pest emergency**	**Pest Emergency-average yield with best control alternative**	**Difference Between Baseline & Emergency**	**Percent Change**
Yield/Acre				
Price per unit				
Gross Revenue				
Cost ($/acre)				
Seed, fertilizer				
Other inputs				
Harvest costs				
Total Operating Costs ($/acre)				
Net Operating Revenue ($/acre)				

Appendix 1.

Table 2. Lethality index of Top 10 candidate insecticides as well as the initial efficacy rating and the change in efficacy over the 7-d trial (laboratory data). Leskey et al. In press.

Rank	Insecticide	Class[a]	Lethality Index	Initial Efficacy[b] (E_0)	Efficacy Change[c] ($E_7 - E_0$)
1	Dimethoate	O	93.3	High	Stable
2	Malathion	O	92.5	High	Stable
3	Bifenthrin	P	91.5	High	Stable

4	Methidathion	O	90.4	High	Stable
5	Endosulfan	-	90.4	Moderate	Increasing
6	Methomyl	C	90.1	High	Stable
7	Chlorpyrifos	O	89.0	Moderate	Increasing
8	Acephate	O	87.5	Moderate	Increasing
9	Fenpropathrin	P	78.3	High	Stable
10	Permethrin	P	77.1	High	Stable

Appendix 2
2011 Reported Damage Data for the States

Delaware fruit growers indicated that BMSB resulted in 30-40% damage on apples and 20% on peaches.

West Virginia orchards reported damage at harvest ranging from 7.5-19.0% in peaches (regional average = 13.5%), in spite of increasingly aggressive tactics. In apples, the range was from 13.5%-46.0% (regional average = 26.2%). .

Maryland orchards percent total crop damage of Apples due to BMSB damage in 2011 was 37.5%. Maryland's percent crop damage of Peaches to BMSB in 2011 was 34.5%.

New Jersey Rutgers Cooperative Extension, Fruit IPM Program routinely surveys the rates of insect and disease injury in harvested peaches, nectarines, and apples. Most of New Jersey's $30-35 million peach and nectarine production goes to wholesale markets, while most of NJ apples go to retail markets . An average of 3.25% damage in peach and nectarine, and 9.75% damage in apples. Given that the published NJ ag statistics for the
2011 season, valued peaches (and nectarines) at $36.6 million and for apples (2010) - $20.18 million. The corresponding value of damaged fruit due to Brown Marmorated Stink Bug (based on sampling) was for Peach and Nectarine = $1.19 million, and for Apple = $1.97 million.

Dear Mr. Butler:

As the registrant for Brigade WSB, FMC supports the section 18 submission by Maryland (and the other supporting states) for the use of Brigade WSB Insecticide on apple, peach and nectarine for the control of Brown Marmorated Stink Bug, Halyomorpha halys.

Please let us know if you require any additional information.

Sincerely,

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April 6, 2012

Bryan Butler
University of Maryland Extension
700 Agriculture Center
Westminster, MD 21157

RE: Bifenture EC and Bifenture 10DF Insecticides - Section 18 Letter of Support

Dear Mr. Butler:

Please be advised that United Phosphorus, Inc. (UPI) fully supports the proposed Section 18 emergency exemption for use of Bifenture EC and Bifenture 10DF Insecticides, containing the active ingredient bifenthrin, for control of Brown Marmorated Stink Bug (*Halyomorpha halys*) on apples, peaches and nectarines in Maryland (and other supporting States). The products we will supply are;

- Bifenture EC – EPA Reg. No. 70506-57
- Bifenture 10DF – EPA Reg. No. 70506-227

UPI will be able to supply product to meet the market demand.

Please contact me at 610-491-2814 or at dave.olson@uniphos.com if you have any questions regarding this information. If you have any questions of a technical nature, please contact our local representative Tony Estes at 864-202-7526, tony.estes@uniphos.com .

Sincerely,

David L. Olson
Director, Regulatory Affairs

cc. Tony Estes

Appendix 3.

Performance of Selected Insecticides on Brown Marmorated Stink Bug

T. Kuhar, H. Doughty, K. Kamminga, L. Lilliston, J. Jenrette, A. Wallingford, A. Wimer and C. Philips
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Selected insecticides were evaluated at Virginia Tech in 2011 using green bean dip bioassays on brown marmorated stink bug nymphs and adults, as well as field efficacy trials on bell peppers. For the latter, four weekly spray applications were made using a backpack sprayer, and % stink bug injury to pepper fruit was assessed on three post-spray harvest dates (in Aug). Insecticides were ranked based on their average performance across all three experiments.

		% mortality from bean dip bioassay*			
Product	**Rate oz/Acre**	**Nymph**	**Adult**	**% control in the field: peppers****	**Avg. % control from all three experiments**
Permethrin 3.2EC	8	97.5	98.8	60.6	85.6
Scorpion 3.24	7.7	76.7	90.0	85.4	84.0
Bifenture 10DF	12.8	100.0	81.9	56.3	79.4
Trebon	8	100.0	100.0	36.5	78.8
Baythroid XL	2.8	92.5	88.2	52.8	77.8
Venom 70	4	100.0	80.0	46.0	75.3

* Mortality refers to the percentage of dead + moribund individuals after 72 hrs.
** Based on reduction in stink bug injury to pepper fruit from three harvests.
[a] Not the highest labeled rate for all vegetables.
Premethrin not labeled on apple post bloom.

Figure 1.

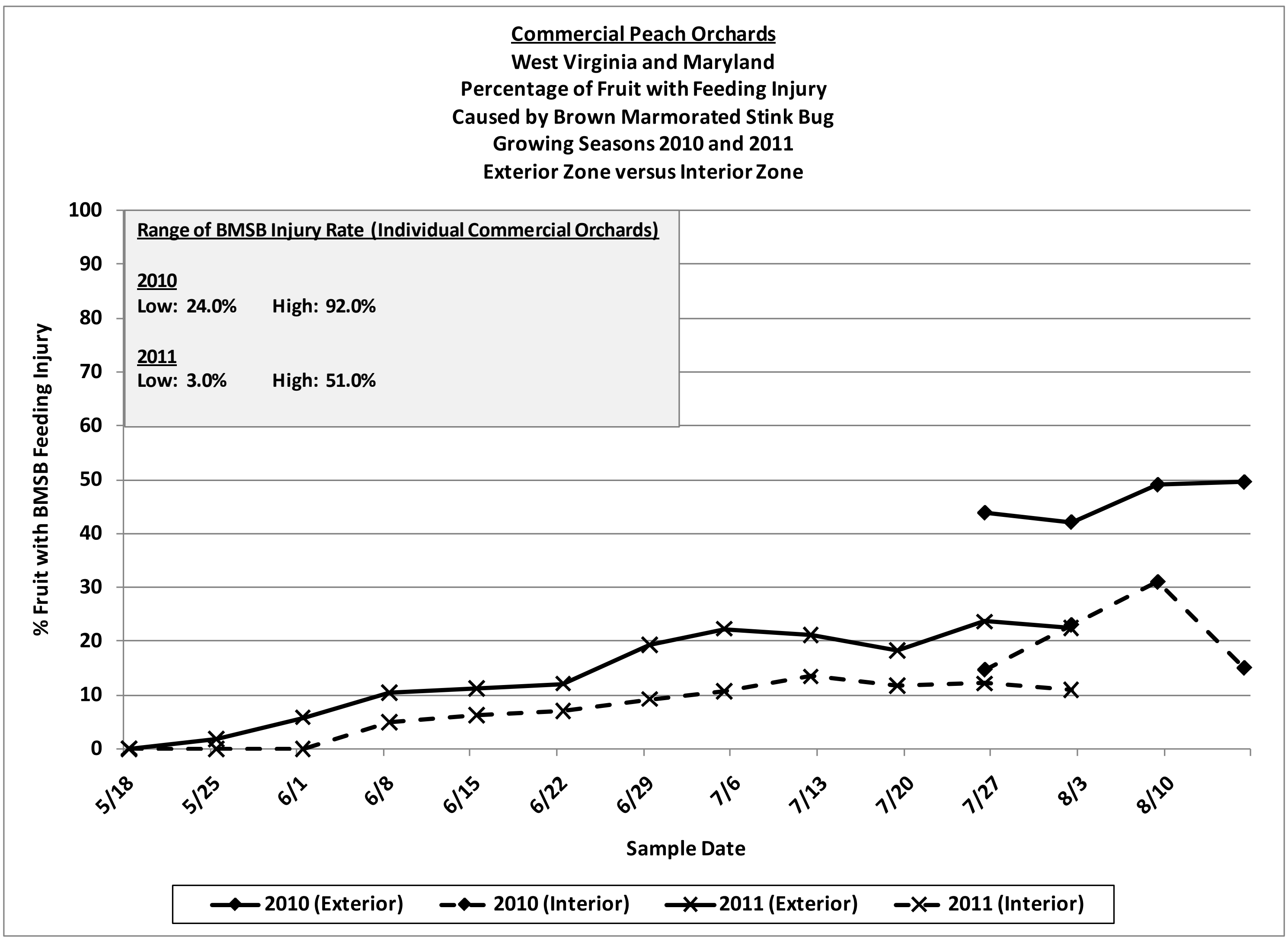
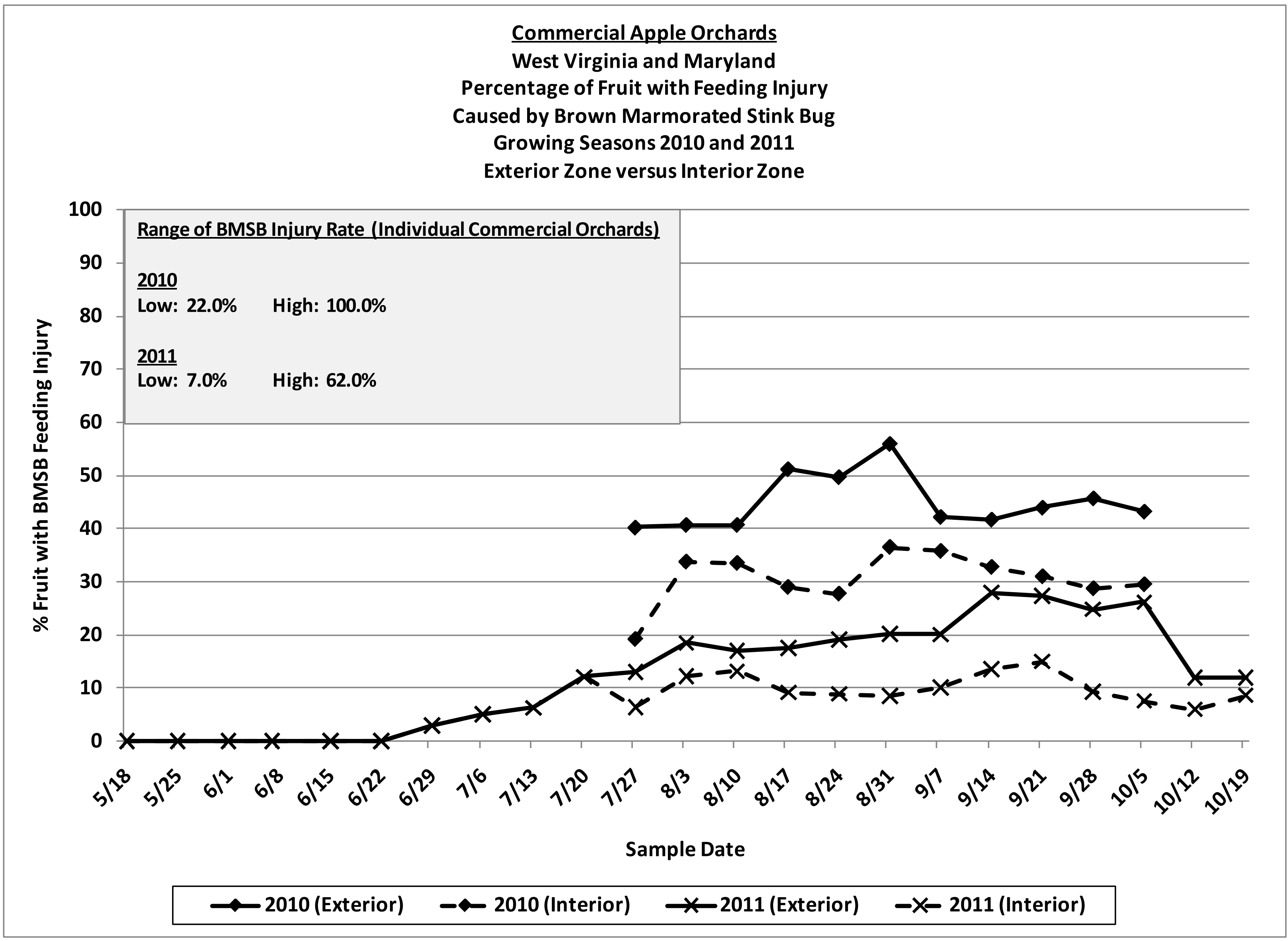


Figure2.


Commercial Apple Orchards
West Virginia and Maryland
Percentage of Fruit with Feeding Injury
Caused by Brown Marmorated Stink Bug
Growing Seasons 2010 and 2011
Exterior Zone versus Interior Zone
Range of BMSB Injury Rate (Individual Commercial Orchards)
2010
Low: 22.0% High: 100.0%
2011
Low: 7.0% High: 62.0%
% Fruit with BMSB Feeding Injury
100
90
80
70
60
50
40
30
20
10
0
5/18
5/25
6/1
6/8
6/15
6/22
6/29
7/6
7/13
7/20
7/27
8/3
8/10
8/17
8/24
8/31
9/7
9/14
9/21
9/28
10/5
10/12
10/19
Sample Date
2010 (Exterior)
2010 (Interior)
2011 (Exterior)
2011 (Interior)